The following information, presentations, suggestions, and options represent the expertise and knowledge of the consulting team hired by the Department of Ecology on its oil transportation study and should be considered pre-decisional discussion points. This information was developed, at the request of Ecology, to solicit ideas and generate discussion at the expert's panel meetings Aug. 5 & 7, 2014.

Marine and Waterfront Facility Risks Affected by Crude By Rail First Draft Findings and Risk Control Options

Washington State Marine and Rail Study,
Marine Experts Meeting, Lacey, Washington
August 7, 2014

CBR Impacts All Washington Waterways

- Current marine vessel traffic carrying CBR crude oil cargoes
  - ATBs from Columbia River to Puget Sound via outer coast
  - Barges within Puget Sound
  - Dilbit is currently moved by barge and tanker in Northern Puget Sound

CBR Impacts All Washington Waterways (2)

- **Potential future marine vessel carrying CBR crude oil cargoes**
  - **Grays Harbor planned projects (3)**
  - **Columbia River (Oregon side) (1)**
  - **Columbia River (Washington side) (2)**
  - **Puget Sound (1)**

CBR Impacts All Washington Waterways (3)

- Impact of CBR on existing crude oil traffic
  - Decline in ANS crude by tanker (will CBR replace this?)
  - Potential reduction in foreign imports
- Impact of CBR on future tank vessel traffic
  - More ATBs
  - More product tankers (if refinery capacity increases)
  - Potentially crude oil export tankers/ATBs

CBR Impacts All Washington Waterways (4)

- **Impact of CBR on future non-tank vessel traffic**
  - **Most likely source of a large spill is from a non-tank vessel (fuel tank rupture in collision or grounding)**
  - **Collision risks increase with traffic density**

CBR Impacts on National Waterways

- Tanker (foreign) traffic from Gulf Coast to Canada
- Not so much on West Coast
  - Jones Act related transportation costs
    - $14 per bbl (including rail costs) for Jones Act
    - $2-$3 per bbl (mideast oil)

There has been no vessel traffic risk assessment incorporating this potential new traffic

Current regulatory, inspection and operational procedures have been effective at prevention. Does CBR change this?

- Anchorages Washington are near capacity
  - Represents long term storage of oil, some of which will be of CBR origin
- Crude oil tankers servicing refineries often make multiple trips to/from anchorages
- Influence of oil type
  - Volatility influences handling (e.g. no pre-booming)
- Additional exports of petroleum products due to CBR leads to more risk of spills of hazardous cargoes other than crude oil

Risk Controls – In-place and Possible

- Training and Management Practices
- Vessel traffic management and assessment
  - Knowledge and prediction lead to prevention
- Navigational Aids
  - Hardware and Software
- Protective location of fuel oil tanks
- Booming – difficult for Bakken
- Inert gas systems
- Escorts and Emergency Tow Vessels (aka Rescue Tugs)

- Cost-Benefit Analyses for Risk Control Options are generally not available
- Rescue tug effectiveness is site specific and experience from use in one location does not necessarily transfer to other locations
- Funding is based upon import by vessel amounts – this will be reduced if this volume is reduced due to CBR and pipeline imports of crude

- The implementation of IMO requirements for protective location of fuel oil tanks for ships constructed in 2010 and later reduces the risk of a fuel oil spill in collisions, allisions and groundings – MARPOL 12A

- A vessel traffic system covering the Columbia River and Grays Harbor would reduce shipping accidents such as collisions and groundings.
- Mariner fatigue leads to human error.
  - Proposed USCG rulemaking on barge inspections and working hours
  - Pilots have more accidents at the end of long voyages
- Experience with Capesize bulk carriers does exist in the region- improve identification of high-risk vessels

Human error is the source of most accidents

Reducing human error is the most effective area of risk control

Evaluation and assessment of the vessel traffic in the region should be an on-going process. Decisions on prevention and response preparedness rely on accurate information to be effective